REMARKS

Claims 1-36 are pending in the application. Claims 1-27 and 33-36 are rejected. Claims 1, 21 and 31 have been amended to clarify the present invention. Claims 28-32 were allowed. Applicant respectfully thanks the Examiner for the allowed subject material. Claim 37 has been added.

Applicants respectfully request reconsideration of the rejections set forth in the Office Action dated January 15, 2004 in view of the following remarks.

Information Disclosure Statements

Applicant kindly requests the Examiner to confirm in the next office action that the information disclosure statements filed 2-27-01, 2-16-2001, 10-19-2001, 6-24-2002, 7-23-2002 and 8-19-2002 have been considered. These information disclosure statements are listed in PAIR for this applications as items, 9, 10, 14, 20, 21 and 22, respectively.

Rejections Under 35 U.S.C. § 102(b)

Claims 1-5, 7-8, 12-13, 15-16, 19, 20, 24-27, 33-34 and 36 are rejected under *35 U.S.C. § 102(b)* as being anticipated by Pelrine (SI International Artificial Muscle Research Fy 1997 page 1-33).

The present invention, as described in pending claims 1-27 and 33-36, recites limitations describing electrical energy generation. For instance, claim 1 recites that "an energy change resulting from the deflection of the electroactive polymer is converted to electrical energy which is removed at the two electrodes and wherein the electroactive polymer has an elastic modulus at most about 100 MPa without electrical energy applied thereto." Pelrine describes supplying electrical energy to the electroactive polymer such that a shape change of the electroactive polymer is produced. For example, when an electric field is applied to the electroactive polymer, the area of the electroactive polymer typically increases. Pelrine does not describe changing the shape of the electroactive polymer to generate electrical energy which is removed at the two electrodes. For example, in the present invention, an outside energy source, such as a mechanical input, may be used to stretch electroactive polymer. When the electroactive polymer contracts, electrical energy may be drawn off from the electroactive polymer. An electroactive polymer used in this manner is

not described in Pelrine. If Examiner disagrees with this assertion by the Applicant, Applicant respectfully requests to point out such a teaching in Pelrine. Therefore, for at least these reasons, Pelrine can't be said to anticipate claims 1-5, 7-8, 12-13, 15-16, 19, 20, 24-27, 33-34 and 36 and the rejection is believed overcome thereby.

In regards to newly presented **claim 37**, the present invention recites that "prior to the deflection an initial area of the electroactive polymer is elastically pre-strained by a factor in the range of about 1.5 times to 50 times the initial area to improve the performance of the generator when the deflection is applied." Thus, the electroactive polymer is elastically stretched to place an initial strain (pre-strain) on the electroactive polymer. When an elastic pre-strain is applied to the polymer, the polymer is stretched from an initial area to a second area. Unless a force is applied to maintain the polymer at the second area, such as securing it to a frame, the polymer will return back to the about the initial area. After the pre-strain is placed on the polymer, the polymer may then be deflected to another position. When the electroactive polymer is used in a generator, the pre-strain is utilized to improve the performance of the generator when the deflection is applied to the pre-strained polymer.

The effect of pre-strain on the polymer was an unexpected result and is not described in the prior art references cited by the Examiner. At the time of the prior art references, it was not believed that significantly stretching the polymer prior to its deflection would result in a performance improvement during its deflection. Thus, this effect is not described in the prior references. As evidence to this fact, the unexpected results of elastic pre-strain on the polymer performance were recognized in the journal Science (see Pelrine, R., R. Kornbluh, Q. Pei, and J. Joseph, "High Speed Electrically Actuated Elastomers with Over 100% Strain," Science, Vol. 287, No. 5454, pages 1-21, 2000 previously cited in an IDS). Therefore, for at least these reasons, the prior art references cited by the Examiner can't be said to anticipate or render obvious claim 37.

Rejections Under 35 U.S.C. § 103(a)

Claims 6, 9-11, 14, 17-18, 21-23 are rejected under *35 U.S.C. § 103(a)* as being unpatentable over Pelrine in view of Kornbluh. The rejection is respectfully traversed.

Kombluh, like Pelrine, describes supplying electrical energy to the electroactive polymer such that a shape change of the electroactive polymer is produced. Kombluh, like Pelrine, does not teach or suggest changing the shape of the electroactive polymer to generate electrical energy, which is removed at the two electrodes. Thus, the combination of Pelrine and Kombluh can't be said to render obvious the present invention as described in claims 6, 9-11, 14, 17-18, 21-23 and the rejection is believed overcome thereby.

Conclusion

In view of the foregoing, Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the number set out below. If any fees are due in connection with the filing of this paper, the Commissioner is authorized to charge such fees to Deposit Account 50-0388 (Order No. SRI1P022).

Respectfully submitted,
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